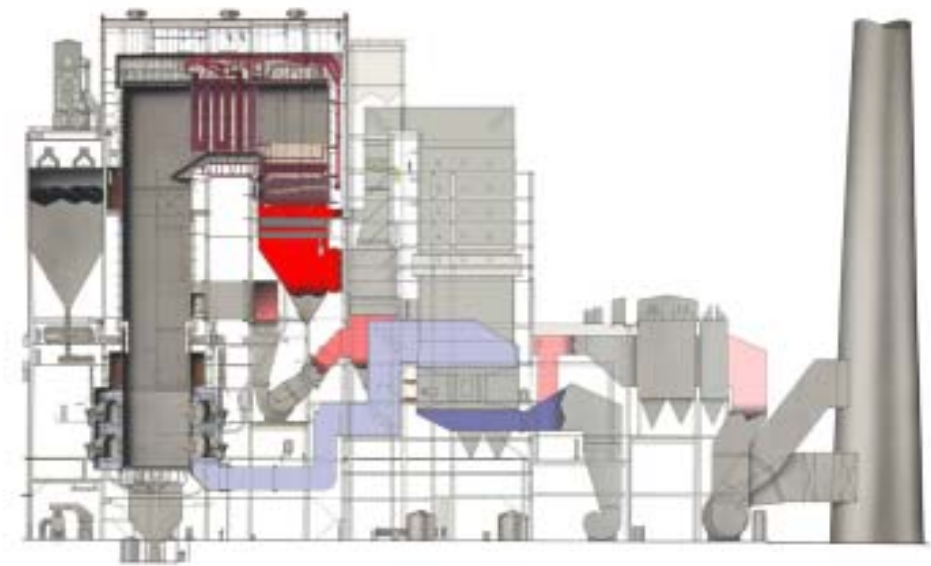
NeuCo, Inc.

- Integrated Optimization Software on three 600 MW units reduces emissions, increases efficiency, and increases reliability.
- Five Optimization Modules: cyclone combustion, sootblowing, SCR operations, thermal performance, and profit optimization.
- Higher efficiencies help to meet Climate Change goals.
- Total Project funding: $19.1 million (DOE share: $8.5 million).



Dynegy Midwest Generation's Baldwin Energy Complex

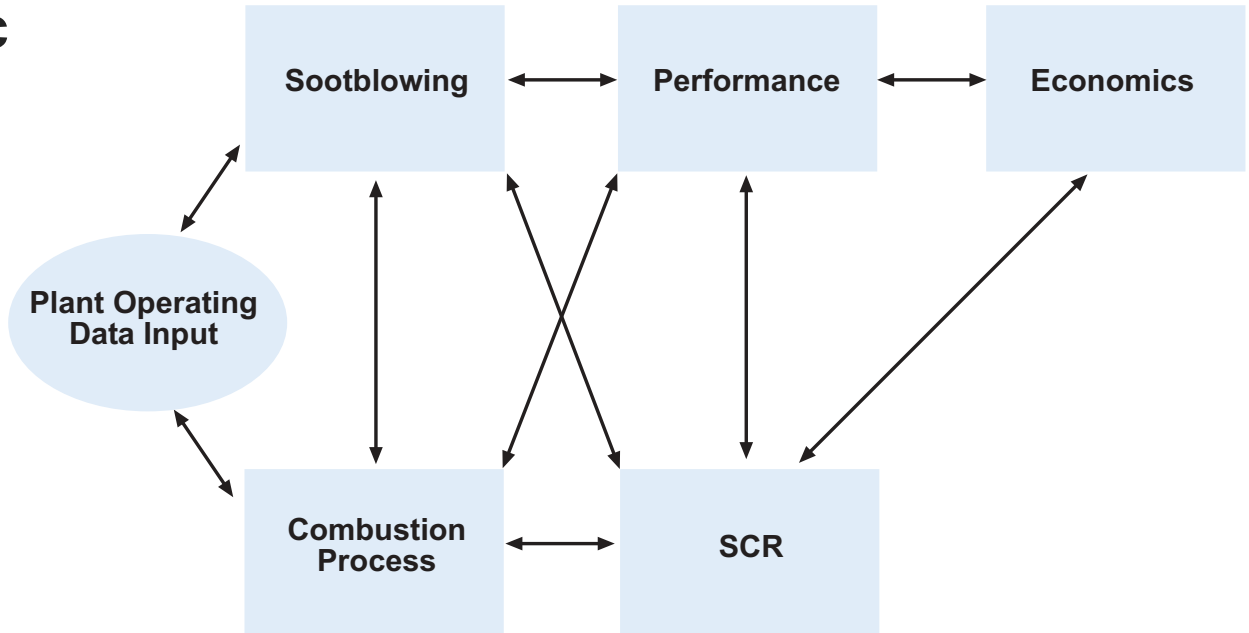
A CCPI Round 1 Project

Background

- NeuCo, Inc. will demonstrate integration of existing controls, control systems, sensors, and computer hardware with advanced optimization techniques on three coal-fired units totaling 1765 MWe.
- Units 1 and 2 consist of cyclone-fired (2x585 MWe) boilers with SCR systems, and Unit 3 consists of a tangentially-fired (595 MWe) boiler with LNBs.
- Project Location:
  Dynegy Midwest Generation's
  Baldwin Energy Complex,
  Baldwin, IL.

Background

- Integrated Optimization Software is becoming an important tool supporting control and management objectives as plant complexity increases through retrofits, repowering, modifications, and new technologies.
- This project builds on NeuCo's ProcessLink™ technology platform that includes neural networks, genetic algorithms, and fuzzy logic techniques.



Technology Uniqueness

- Overall architecture of control platform permits flexible deployment strategies. Application architecture built around interoperable services.
- Service module allows applications to leverage networked computational resources rather than requiring all data and logic to be resident on a single computer.
- Optimization techniques can be applied to a variety of systems within coal power plants using existing control technologies, linking these systems together.
- Increasing complexity of modern power plants will require an integrate process optimization approach.

Schedule

- **NEPA Process**
  - Categorical Exclusion Completed
- **Combustion Optimization**
  - Start 02/04 — Finish 02/08
- **Soot Optimization**
  - Start 02/04 — Finish 02/08
- **SCR Optimization**
  - Start 02/04 — Finish 02/08
- **Performance Optimization**
  - Start 02/04 — Finish 02/08
- **Profit Optimization**
  - Start 02/04 — Finish 02/08

Potential Benefits

- **Application of this technology will result in:**
  - Increased thermal efficiency by ~1.5%.
  - One year extension of SCR catalyst and 15% reduction of NH_3 consumption.
  - NOx emissions reductions of 5%.
  - Reductions in emissions of CO_2, mercury, and particulates (due to increased thermal efficiency).
  - Lower costs to consumers and an increase in power company profitability due to overall plant reliability and efficiency.

Potential Benefits

- **Successful commercial application of Integrated Optimization Software System in the U.S. would significantly reduce NOx emissions:**
  - 13,420 tpy of NOx with cyclone optimization
  - 64,990 tpy of NOx with sootblowing optimization
- **By installing optimization technologies, power companies could save annually:**
  - $ 7.5 million for SCR units
  - $28.6 million for sootblowing operations
  - $51.5 million for performance improvement
  - $51.5 million for profit optimization

Benefits Analysis www.NETL.DOE.GOV/coalpower/CCPI/Index.html